AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A hydrogen gas sensor comprising a first electrode, a second electrode and an electrolyte contacting with said first electrode and said second electrode,

wherein said first electrode and said second electrode are made of corresponding different materials in chemical potential for hydrogen gas, and said first electrode is made of higher chemical potential material and functions as a detecting electrode, and said second electrode is made of lower chemical potential material and functions as a standard electrode,

wherein said hydrogen gas is detected on an electromotive force generated between said first electrode and said second electrode.

Claim 2 (currently amended): A hydrogen gas sensor comprising a first electrode, a second electrode and an electrolyte contacting with said first electrode and said second electrode,

wherein said first electrode and said second electrode are made of corresponding different materials in absorption-dissociation active degree for hydrogen gas, and said first electrode is made of higher absorption-dissociation material and functions as a detecting electrode, and said second electrode is made of lower absorption-dissociation material and functions as a standard electrode,

wherein said hydrogen gas is detected on an electromotive force generated between said first electrode and said second electrode.

Claim 3 (previously presented): The hydrogen gas sensor as defined in claim 1, wherein said first electrode includes a first electrode material which exhibits a standard electromotive force of 0.8V or over in the cell of $H_2(-)|50mol/m^3\ H_2SO_4|sample(+)$, and said second electrode includes a second electrode material which exhibits a standard electromotive force of less than 0.8V in the same cell construction.

Claim 4 (previously presented): The hydrogen gas sensor as defined in claim 3, wherein said first electrode material includes at least one selected from the group consisting of Pt, Pt alloy, Pd and Pd alloy, and said second electrode material includes at least one selected from the group

consisting of Ni, Ni alloy, Ti, Ti alloy, Cu, Cu alloy, Fe, Fe alloy, Al, Al alloy and organic conductive material.

Claim 5 (cancelled)

Claim 6 (previously presented): The hydrogen gas sensor as defined in claim 1, wherein said first electrode and said second electrode are shaped in plate and disposed so as to be opposed to one another, and said electrolyte is disposed between said first electrode and said second electrode.

Claim 7 (previously presented): The hydrogen gas sensor as defined in claim 1, wherein said first electrode and said second electrode are shaped in rod or line and disposed on an insulating substrate so as to be separated from one another, and said electrolyte is disposed between said first electrode and said second electrode.

Claim 8 (previously presented): The hydrogen gas sensor as defined in claim 1, wherein said second electrode is shaped in cylinder so that said first electrode is disposed in said second electrode, and said electrolyte is disposed at least partially in between said first electrode and said second electrode.

Claim 9 (previously presented): The hydrogen gas sensor as defined in claim 1, wherein said electrolyte is a solid electrolyte.

Claim 10 (currently amended): The hydrogen gas sensor as defined in claim 9, wherein said solid electrolyte is made of a solid electrolyte raw material and a reinforcing material ~~such as glass wool~~, wherein said solid electrolyte is made through the solidification of said solid electrolyte raw material with said reinforcing material or the infiltration of said reinforcing material into said electrolyte raw material which is processed in porosity or mesh.

Claim 11 (previously presented): A hydrogen gas leak alarm system comprising a hydrogen gas sensor as defined in claim 1 and a voltage comparator, wherein an electromotive force variation as a hydrogen gas detecting information from said hydrogen gas sensor is compared

with a reference voltage of said voltage comparator, thereby to put out an signal on the comparison of said electromotive force variation and said reference voltage.

Claim 12 (previously presented): A hydrogen gas leak controlling system comprising a hydrogen gas sensor as defined in claim 1 and a voltage comparator, wherein an electromotive force variation as a hydrogen gas detecting information from said hydrogen gas sensor is compared with a reference voltage of said voltage comparator, thereby to put out a signal on the comparison of said electromotive force variation and said reference voltage.

Claim 13 (previously presented): A hydrogen gas leak information transmitting system comprising a hydrogen gas sensor as defined in claim 1 and a voltage comparator, wherein an electromotive force variation as a hydrogen gas detecting information from said hydrogen gas sensor is compared with a reference voltage of said voltage comparator, thereby to put out a signal on the comparison of said electromotive force variation and said reference voltage.

Claim 14 (currently amended): The hydrogen gas leak alarm system as defined in claim 11, wherein said voltage comparator is configured such that a threshold voltage of a ~~Shumitt inverter~~ Schmitt Inverter is defined as said reference voltage, and compared with an input voltage corresponding to said hydrogen gas detecting information, thereby to put out said signal.

Claim 15 (currently amended): The hydrogen gas leak controlling system as defined in claim 12, wherein said voltage comparator is configured such that a threshold voltage of a ~~Shumitt inverter~~ Schmitt Inverter is defined as said reference voltage, and compared with an input voltage corresponding to said hydrogen gas detecting information, thereby to put out said signal.

Claim 16 (currently amended): The hydrogen gas leak information transmitting system as defined in claim 13, wherein said voltage comparator is configured such that a threshold voltage of a ~~Shumitt inverter~~ Schmitt Inverter is defined as said reference voltage, and compared with an input voltage corresponding to said hydrogen gas detecting information, thereby to put out said signal.

Claim 17 (previously presented): A hydrogen gas sensor array comprising a plurality of hydrogen gas sensors as defined in claim 1, wherein said hydrogen gas sensors are arranged on the same substrate.

Claim 18 (previously presented): A hydrogen gas analyzer comprising a hydrogen gas sensor as defined in claim 1 and an electric circuit for detecting an electromotive force from said hydrogen gas sensor,

wherein hydrogen gas concentration is detected in dependence on the intensity of said electromotive force.

Claim 19 (previously presented): A hydrogen gas sensor element comprising a hydrogen gas sensor as defined in claim 1 and a photo sensor for detecting hydrogen gas shielding contamination from external environment through the detection of an optical signal from an external LED, whereby Fail-Safe function for enhancing reliability in hydrogen gas detection is applied to said hydrogen gas sensor element.

Claim 20 (currently amended): A Fail-Safe function for enhancing reliability in hydrogen gas detection wherein hydrogen gas shielding contamination of a sensor component of a hydrogen gas sensor from external environment is detected through the detection of an optical signal from an external LED by a photo sensor.

Claim 21 (previously presented): The hydrogen gas sensor as defined in claim 2, wherein said first electrode includes a first electrode material which exhibits a standard electromotive force of 0.8V or over in the cell of H_2(-)? 50mol/m^3 H_2SO_4? sample(+), and said second electrode includes a second electrode material which exhibits a standard electromotive force of less than 0.8V in the same cell construction.

Claim 22 (previously presented): The hydrogen gas sensor as defined in claim 21, wherein said first electrode material includes at least one selected from the group consisting of Pt, Pt alloy, Pd and Pd alloy, and said second electrode material includes at least one selected from the

group consisting of Ni, Ni alloy, Ti, Ti alloy, Cu, Cu alloy, Fe, Fe alloy, Al, Al alloy and organic conductive material.

Claim 23 (cancelled)

Claim 24 (previously presented): The hydrogen gas sensor as defined in claim 2, wherein said first electrode and said second electrode are shaped in plate and disposed so as to be opposed to one another, and said electrolyte is disposed between said first electrode and said second electrode.

Claim 25 (previously presented): The hydrogen gas sensor as defined in claim 2, wherein said first electrode and said second electrode are shaped in rod or wire and disposed on an insulating substrate so as to be separated from one another, and said electrolyte is disposed between said first electrode and said second electrode.

Claim 26 (previously presented): The hydrogen gas sensor as defined in claim 2, wherein said second electrode is shaped in cylinder so that said first electrode is disposed in said second electrode, and said electrolyte is disposed at least partially in between said first electrode and said second electrode.

Claim 27 (previously presented): The hydrogen gas sensor as defined in claim 2, wherein said electrolyte is a solid electrolyte.

Claim 28 (currently amended): The hydrogen gas sensor as defined in claim 2, wherein said solid electrolyte is made of a solid electrolyte raw material and a reinforcing material ~~such as glass wool~~, wherein said solid electrolyte is made through the solidification of said sold electrolyte raw material with said reinforcing material or the infiltration of said reinforcing material into said electrolyte raw material which is processed in porosity or mesh.

Claim 29 (previously presented): A hydrogen gas leak alarm system comprising a hydrogen gas sensor as defined in claim 2 and a voltage comparator, wherein an electromotive force variation as a hydrogen gas detecting information from said hydrogen gas sensor is compared

with a reference voltage of said voltage comparator, thereby to put out a signal on the comparison of said electromotive force variation and said reference voltage.

Claim 30 (previously presented): A hydrogen gas leak controlling system comprising a hydrogen gas sensor as defined in claim 2 and a voltage comparator, wherein an electromotive force variation as a hydrogen gas detecting information from said hydrogen gas sensor is compared with a reference voltage of said voltage comparator, thereby to put out a signal on the comparison of said electromotive force variation and said reference voltage.

Claim 31 (previously presented): A hydrogen gas leak information transmitting system comprising a hydrogen gas sensor as defined in claim 2 and a voltage comparator, wherein an electromotive force variation as a hydrogen gas detecting information from said hydrogen gas sensor is compared with a reference voltage of said voltage comparator, thereby to put out a signal on the comparison of said electromotive force variation and said reference voltage.

Claim 32 (currently amended): The hydrogen gas leak alarm system as defined in claim 29, wherein said voltage comparator is configured such that a threshold voltage of a ~~Shumitt inverter~~ Schmitt Inverter is defined as said reference voltage, and compared with an input voltage corresponding to said hydrogen gas detecting information, thereby to put out said signal.

Claim 33 (currently amended): The hydrogen gas leak controlling system as defined in claim 30, wherein such voltage comparator is configured such that a threshold voltage of a ~~Shumitt inverter~~ Schmitt Inverter is defined as said reference voltage, and compared with an input voltage corresponding to said hydrogen gas detecting information, thereby to put out said signal.

Claim 34 (currently amended): The hydrogen gas leak information transmitting system as defined in claim 31, wherein such voltage comparator is configured such that a threshold voltage of a ~~Shumitt inverter~~ Schmitt Inverter is defined as said reference voltage, and compared with an input voltage corresponding to said hydrogen gas detecting information, thereby to put out said signal.

Claim 35 (previously presented): A hydrogen gas sensor array comprising a plurality of hydrogen gas sensors as defined in claim 2, wherein said hydrogen gas sensors are arranged on the same substrate.

Claim 36 (previously presented): A hydrogen gas analyzer comprising a hydrogen gas sensor as defined in claim 2 and an electric circuit for detecting an electromotive force from said hydrogen gas sensor,

wherein hydrogen gas concentration is detected in dependence on the intensity of said electromotive force.

Claim 37 (previously presented): A hydrogen gas sensor element comprising a hydrogen gas sensor as defined in claim 2 and a photo sensor for detecting hydrogen gas shielding contamination from external environment through the detection of an optical signal from an external environment through the detection of an optical signal from an external LED, whereby Fail-Safe function for enhancing reliability in hydrogen gas detection is applied to said hydrogen gas sensor element.

Claim 38 (new): Use of a hydrogen gas sensor as defined in claim 1, wherein said first electrode and said second electrode are disposed in the same atmosphere, thereby to contact with said hydrogen gas simultaneously.

Claim 39 (new): Use of a hydrogen gas sensor as defined in claim 2, wherein said first electrode and said second electrode are disposed in the same atmosphere, thereby to contact with said hydrogen gas simultaneously.